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Approach to hypertension in geriatric population

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ABSTRACT

Hypertension is a systolic blood pressure >140 and/or diastolic blood pressure >90, measured with the appropriate method and confirmed by repeated measurements. Hypertension is quite common in our country, as it is all over the world. Its prevalence increases with age. Isolated systolic hypertension is especially common among the elderly. Considering the increasing comorbidity with age, blood pressure regulation has a very important place in the geriatric group to prevent complications such as coronary artery diseases, chronic kidney diseases, and cerebrovascular diseases. During treatment, appropriate drug selection should be made, especially in geriatric individuals, by evaluating comorbidity and polypharmacy.

Keywords: Hypertension, geriatrics, polypharmacy

INTRODUCTION

Hypertension is a systolic blood pressure >140 and/or diastolic blood pressure >90, measured with the appropriate method and confirmed by repeated measurements.[1] The global prevalence of hypertension is approximately 30%, but this rate reaches 60% in advanced age.[2] Hypertension is quite common in our country, as it is in the whole world. The prevalence of hypertension reaches 70% in the 60-69 age group, 76% in the 70-79 age group, and 79.7% in the 80-year-old and older age groups. Due to the increased risk of hypertension in the geriatric patient group, blood pressure should be monitored at every visit to the doctor. Patients should be monitored carefully, especially since the incidence of isolated systolic hypertension increases with age. Hypertension may occur alone, but it is frequently associated with dyslipidemia and impaired glucose tolerance in advanced age, which increases cardiovascular risks. It can also cause comorbidities, such as chronic kidney disease and cerebrovascular disease, as well as unexpected death.[2,3]

WHAT IS APPROPRIATE BLOOD PRESSURE MEASUREMENT?

Although the gold standard is the arterial catheter, measurement from the brachial artery using a sphygmomanometer is preferred in clinical practice. For geriatric individuals, a validated automatic electronic upper arm control device may be used. In addition to the selection of the appropriate instrument, the appropriate environment and conditions are very important. When evaluating the measurement, the time of measurement, measurement during exercise or meal, or any condition that activates the adrenergic system should be known by the physician, as it will increase blood pressure. Preferably, the brachial artery is used in the measurement. It should be performed with at least 2 consecutive measurements and with separate measurements from both arms. The higher measurement between the arms should be taken as the basis. A measurement should be made from the right arm at the follow-up of the patient.[4,5]

Brachial artery atherosclerosis should be considered in elderly individuals. During measurement, a highly calcified brachial artery causes unreal elevations in blood pressure. This is also called pseudohypertension. Pseudohypertension should be suspected in elderly patients with disseminated atherosclerosis, in patients in whom the radial artery is still palpated despite cuff pressure exceeding auscultatory systolic blood pressure (Osler's sign), and in elderly individuals with persistently high blood pressure and resistant hypertension. Intra-arterial measurement, the gold standard method, is necessary for these patients.[5,6,7]

Orthostatic hypotension is a factor affecting hypertension regulation in elderly individuals. The presence or absence of orthostatic hypotension is diagnosed with a decrease of >20 mmHg in SBP or >10 mmHg in DBP by separate measurements performed while the individual is sitting and standing. In this condition, in which antihypertensive drugs such as salt restriction, high-dose diuretics, peripheral adrenergic blockers, and alpha blockers are involved in the etiology, effects on venous return and changes in cardiac output with advancing age are an etiologic factor on their own. Its evaluation is very important for the elderly, as it may lead to fainting, falls, and consequently life-threatening conditions.[8,9]

Another factor affecting proper measurement is white-coat hypertension. Considering this situation, it is recommended to confirm with a measurement taken in an environment where the individual feels comfortable. The two

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most commonly used methods today are home blood pressure measurement and ambulatory blood pressure monitoring.[9]

STAGING

According to blood pressure level, the JNC-VI report is staged as follows (**Table 1**).

Table 1. Staging of blood pressure

	Blood Pressure (mmHg)		
Blood Pressure Stages	**Systolic**		**Diastolic**
Hypertension			
Stage 1	140-159	or	90-99
Stage 2	160-179	or	100-109
Stage 3	>180	or	>110
Isolated systolic hypertension	>140	< 90	

RISK FACTORS

Risk factors for hypertension are examined in two groups:

Group 1 = Non-modifiable risk factors: Age, gender, ethnicity, family history

Group 2 = Modifiable risk factors: Diet, sedentary lifestyle, obesity, psychosocial status, habits (such as alcohol, smoking, and drugs), irregular blood glucose regulation, dyslipidemia, obstructive sleep apnea, medications, etc.[10]

Although age is an unchangeable factor, it is very important to control the risk status that increases with age in geriatric individuals by keeping the modifiable risk factors under control with the necessary awareness and appropriate treatment.

ETIOPATHOGENESIS

There are many conditions in the etiopathogenesis of hypertension. Genetic factors, increased sympathetic system activity (increased heart rate, increased cardiac output, and peripheral resistance), renal factors (increased sodium load, renin-angiotensin-aldosterone system), impairments in vascular mechanisms (nitric oxide and endothelin secretion), obesity, insulin resistance, and obstructive sleep apnea can be listed. In the etiopathogenesis of hypertension in geriatric individuals, the following factors are at the forefront.[11] (**Table 2**).

Table 2. Physiological changes that occur with aging

* Changes in vascular structures are inevitable. Thickening of the intima and media and sclerosis of the arteries occur
* Cardiac output and heart rate decrease, and systemic vascular resistance increases
* Central obesity and insulin resistance develop with age
* There is a decrease in glomerular filtration
* Inadequate vasodilation is not achieved as a result of the decrease in B-adrenergic response with aging

HYPERTENSION AND POLYPHARMACY

Especially in geriatric individuals, polypharmacy is inevitable with the increase in chronic diseases. Therefore, it is very important to question the prescription drugs used in the clinical evaluation of hypertension. In addition, it is also necessary to question over-the-counter medications and dietary supplements, the frequency of use of which has increased with the development of alternative medicine. Glucocorticoids, non-steroidal anti-inflammatory drugs, sodium-containing agents (antacids), sympathomimetic agents (decongestants, anorectics), oral contraceptives, vascular endothelial growth factors (bevacizumab), tyrosine kinase inhibitors (sorafenib, sunitinib, etc.), calcineurin inhibitors (cyclosporin, tacrolimus), erythropoietin, agents containing stimulants such as cocaine and amphetamine, and neuropsychiatric drugs should be evaluated when hypertension is diagnosed.[12,13,14]

Whenever possible, medicines associated with increased blood pressure should be reduced, discontinued, or changed to alternative medicines.

TREATMENT APPROACH

The treatment algorithm and target values have been standardized in our country with the Hypertension Consensus Guideline. When starting treatment, not only the blood pressure value but also comorbid risk factors and chronic diseases should be evaluated. In previous years, increases in systolic blood pressure with age were considered physiologic and not treated. However, today, hypertension is thought to be the cause of diseases with high morbidity and mortality, such as cerebrovascular diseases and coronary diseases, in elderly individuals. A decrease in these complications is observed with hypertension regulation.15

Lifestyle modification should be recommended to all individuals, regardless of stage. Lifestyle modification should include keeping the body mass index in the normal range, limiting salt consumption, avoiding alcohol and smoking, abandoning a sedentary lifestyle, and avoiding stress.16 Subsequently, medical treatment should be shaped by evaluating risk factors. (**Table 3**).

Table 3. Treatment assessment according to risk groups with high blood pressure

Degree of blood pressure (mmHg)	No risk factors and no target organ damage	At least one risk factor except diabetes mellitus; no target organ damage	Risk factor, cardiovascular disease or target organ damage present
High-normal (130-139/85-89)	Non-pharmacological treatment	Non-pharmacological treatment	Drug treatment
Stage 1 (140-159/90-99)	Non-pharmacological treatment (up to 12 months)	Non-pharmacological treatment (up to 6 months)	Drug treatment
Stages 2 and 3 (>160/>100)	Drug treatment	Drug treatment	Drug treatment

Risk factors: Heart failure, renal failure, diabetes mellitus, smoking, advanced age, LDL (low-density lipoprotein) >130 mg/dl *
* Hypercholesterolemia is also very common. Dietary cholesterol intake should be restricted and controlled with medical treatment if necessary.

Medical treatment; In case of increased blood pressure (SBP=130-139mm and/or DBP=84-89 mmHg) and Stage 1 HT (SBP=140-159mmHg and/or DBP=90-99 mmHg), if there are no risk factors (coronary artery disease, diabetes mellitus, chronic kidney disease, smoking, advanced age, high cholesterol level), the patient should be followed up by trying lifestyle changes with priority. Medical treatment should be added if there is no response in the three-month periodic controls. (**Table 4**).

Table 4. Medical agents used in treatment
ACE inhibitors
ARBs
Diuretics
Calcium channel blockers
B-blockers

In stages 2 and 3 HT (SBP ≥160 mmHg and/or DBP ≥100 mmHg), medical treatment should be started immediately with lifestyle modification. Medical treatment may include diuretics, calcium channel blockers (CCBs), ACE inhibitors, ARBs, and anyone or combination of ARBs and B-blockers (except ACE inhibitors and ARB combinations). In patients with blood pressure ≥150/90 mmHg, it is recommended to start first-line treatment with combination therapy.[1,17]

There are issues to be considered in the treatment of geriatric individuals. The systolic blood pressure threshold for starting medical treatment for individuals aged 80 years and older has been raised. The targeted blood pressure values are set at 120-130/70-80 mmHg and are not tied to a clear number, suggesting a patient-based evaluation. However, although the blood pressure target set in geriatric individuals is almost close to the targets set in young individuals, it is kept slightly higher; 130-140/70-80 is considered being safer. While ESC/ESH, THUR, ISH, and Canadian Hypertension guidelines suggest that the blood pressure target can be kept lower in the elderly; JNC8, ADA 2021, and SEMT (Society of Endocrinology and Metabolism of Turkey) Diabetes guidelines state that the target range can be kept slightly higher within the benefit-benefit relationship, taking into account the functional and mental capacity of the elderly individual. According to the Hypertension Consensus Report, the targeted blood pressures vary according to age, but it is stated that it can be kept around 120-130/70-80 mmHg between 65-79 years of age.[14,17,18] Thus, individualized treatment with multidimensional evaluation in geriatric individuals is left open-ended.

Any of the four groups of drugs (diuretics, CCBs, ACE inhibitors, and ARBs) or a combination (except ACE inhibitors and ARBs) can be used in drug preference. However, in hypertensive patients over 65 years of age, drug compliance should be assessed before increasing the dose and number of drugs. Calcium channel blockers or diuretics should be the first choice in the treatment sequence. ACE inhibitors and ARBs are then recommended. B-blockers should be avoided unless there is a special indication. Especially in the frail elderly or those at risk of orthostatic hypotension, it is recommended to start treatment with a single drug and to increase the dose, and switch to the combination more slowly.[19,20]

The consensus among many of the above-mentioned guidelines and meta-analyses is that blood pressure control is the most important factor in reducing cardiovascular risk in all hypertensive patients, whether young or old. Even though the approach to hypertension treatment has been standardized by guidelines, an individual treatment algorithm should be established by evaluating lifestyle, comorbidities, and polypharmacy, especially in elderly individuals.[21]

CONCLUSION

The population is getting older all over the world, and elderly individuals have many comorbidities and are more vulnerable to frailty. Hypertension, the prevalence of which increases with age, is quite common in our country as well as in the whole world. Isolated systolic hypertension is especially common among the elderly. Considering the comorbidities in the elderly and the fact that the elderly is more vulnerable, diagnosis and treatment should be planned more sensitively in the geriatric group, paying attention to polypharmacy.

ETHICAL DECLARATIONS

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